1993

Herbal tea consumption during pregnancy

Margaret Wilson
University of Wollongong

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HERBAL TEA CONSUMPTION DURING PREGNANCY

by

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Submitted as part requirement for the Master of Science (Nutrition and Dietetics)

Department of Public Health and Nutrition
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Dedication

To Molly Faith
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Molly Wilson, whose arrival into my life precipitated my interest in this subject

The man upstairs
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This study sought to investigate herbal tea consumption during pregnancy. The sample was drawn from women involved with homebirth support groups in N.S.W. who were pregnant or had given birth in the last two years, and who consumed herbal tea during their pregnancy. Thirty seven women participated in the study.

Each participant completed a two page postal questionnaire which requested information on the variety of herbal teas consumed, patterns of consumption, and reasons for consuming herbal tea as an alternative to tea/coffee during pregnancy, as well as information sources these women would use if questioning the safety of consuming a herbal tea during pregnancy.

The majority of the sample (79 percent) increased their intake of herbal tea during pregnancy. Sixty two percent (23 women) stated they consumed herbal tea as well as tea/coffee during pregnancy, while the remaining 38 percent (14 women) consumed herbal tea as an alternative to tea/coffee during pregnancy.

Nineteen varieties of herbal teas were identified by the women as being consumed during pregnancy. The most popular herbal teas were chamomile, raspberry, and peppermint, consumed at least once during pregnancy by 78 percent, 68 percent, and 57 percent of the women, respectively.

If questioning the safety of consuming a herbal tea during pregnancy, the majority of the women (76 percent) would seek information from a midwife. Forty three percent would consult a naturopath or herbalist, while 5 women (14 percent) would use a book. Not one of the sample would ask a dietitian for the information.
Although the results obtained from this well-educated group cannot be extrapolated to the general Australian population of pregnant women, nor to those planning a homebirth, it is apparent that some women do consume herbal teas during pregnancy. Since the safety of consuming herbal teas during pregnancy is questionable, health practitioners have a responsibility to provide pregnant women with accurate information based on current knowledge.
CHAPTER 1

INTRODUCTION

The importance of maternal nutrition during pregnancy is now well recognised. Although many genetic and environmental factors can influence fetal development, maternal diet is one variable over which women have some control (Worthington-Roberts:1987). As such, there is an abundance of information available on the nutritional support of successful reproduction, but very little information on the safety of consuming herbal teas during pregnancy.

Herbal teas consist of an infusion made by adding the dried leaves, flowers, or stems from a particular herb to boiled water. The seeds, roots, or bark of a plant can also be used (Hills:1985). Concentrations of various substances in herbal teas will vary depending on their solubility in water and time spent steeping, as well as the growing conditions, maturity, and processing of the herb (Abraham and Hammond:1987).

Although herbal teas have been used medicinally for centuries (Larkin:1983), their use has increased in recent years. They are viewed as natural products and therefore 'safe' and 'healthy' alternatives to conventional beverages (Baldwin et al.:1987). However, several popular herbs, previously considered safe, have now been restricted or banned.

Adverse reactions to undesirable and toxic substances present in some herbal teas have recently been reported in the medical press (Baldwin et al.:1987, Ridker:1989). Concern has also been expressed over the consumption of herbal teas during pregnancy (Moulds and McNeil:1988), yet there is a shortage of clinical research and case studies examining the effects of various herbal teas on the developing fetus.
Information on herbal tea consumption by pregnant women is also scarce, despite the recognition that herbs are used by women throughout the world during pregnancy and labour (Bourdy and Walter:1992). Research suggests that pregnant women may consume herbal teas as an alternative to tea and coffee due to aversion to caffeine containing beverages (Fairburn et al:1992) and in an effort to reduce their caffeine intake (Baldwin et al.:1987). Pregnant women are likely to be attracted to the ‘natural’ aspect of herbal teas (Talalaj and Czechowicz:1990a), while the apparent benefits of herbal teas would also be appealing.

The practice of consuming herbal teas during pregnancy is likely to occur in those women choosing to give birth at home, considering the characteristics and attitudes of this group. Bastian (1992) found that the majority of women who planned to give birth at home reported positive attitudes towards alternative medicine. Studies have also shown that women choosing homebirths are usually older and more educated than those women who plan a hospital birth (Crotty et al.:1990, Bastian and Lancaster:1992). A more critical attitude to conventional procedures and a greater interest in being actively involved in their own care (Waldenstrom and Nilsson:1993) are additional attitudes recognised in women who choose alternative maternity care.

Given that uncertainty exists over the effects of herbal teas on pregnancy outcome, and that women preferring homebirth appear to possess characteristics and attitudes that differ to those of other pregnant women, there is a need to identify factors relating to the consumption of herbal teas by pregnant women who choose to give birth at home. Determining the sources of information used by these women, if questioning the safety of consuming a herbal tea during pregnancy, is important when designing strategies aimed at possibly modifying their herbal tea intake.
This study, ‘Herbal Tea Consumption During Pregnancy’, is of benefit as an initial investigation into the area. The results can be used to assess the role of health professionals in providing education for pregnant women preferring alternative maternity care, particularly homebirth, and may form a basis to continue investigation into the consumption of herbal teas and other ‘unconventional’ substances, during pregnancy.

This study aims to answer the following questions on women involved with homebirth support groups in N.S.W. who are currently pregnant or have given birth within the last two years, and who drank herbal tea during their most recent pregnancy.

1) What is the pattern of herbal tea consumption in this group of women?

2) Why do these women drink herbal teas as an alternative to tea or coffee during pregnancy?

3) What are the main sources of information for these women, if questioning the safety of consuming a herbal tea during pregnancy?
2.1 Problems With Herbal Teas

Herbal teas have been used for centuries to cure or alleviate a variety of afflictions and generally improve health (Larkin:1983). In recent years, there has been a resurgence in the use of herbal teas (Dickstein and Kunkel:1980), which are often considered as 'natural' products and therefore 'safe' and 'healthy' alternatives to conventional beverages (Baldwin et al.:1987).

The traditional use of herbs for centuries without harmful effects is often cited as proof that herbs are safe (Wiesner:1984, Talalaj and Czechowicz: 1988), yet recent research has resulted in several popular herbs, previously considered safe, being restricted or banned. Comfrey is one such herb. It contains pyrrolizidine alkaloids, known to be hepatotoxic in humans (Kumana et al.:1983, Ridker et al.:1985), so is now classified as a Schedule 1 item of the Standard for Uniform Scheduling of Drugs and Poisons (Abbott:1988), although there are no reports of this herb being carcinogenic in humans (IARC:1983).

While the poisons legislation regulates the possession, use, and sale of scheduled substances, it is inadequate in controlling herbs used for teas since foods containing scheduled substances are exempt from the provisions of poisons regulations in most States and Territories (NFA:1993). The National Food Authority (NFA) has therefore put a proposal to the National Food Council for amendment of the Food Standards Code. This proposal (P54) prohibits the use of certain plants in, or as, food since they pose an unacceptable risk to public health and safety (NFA:1993).
Additional safeguards exist to ensure the public are not exposed to hazardous herbs. These include the Australian Customs (Prohibited Imports) Regulations, which control the importation of botanicals containing narcotic and hallucinogenic substances (NFA:1993), and Quarantine Inspection. Despite these controls, imported herbal preparations have been found contaminated with drugs (Bowron and Lewis:1987, Bury et al.:1987) and animal faeces (Koch:1993).

Tighter regulation of herbal preparations has been suggested at various times in the past but reaching conformity on such issues as defining when herbal preparations are used as a food compared to their use as therapeutic agents, has been difficult (Moulds and McNeil:1988). Since most herbal teas are not sold as therapeutic agents, they are exempt from the high standard of regulation that conventional agents are subject to (Moulds and McNeil;1988). Food labelling laws apply to the majority of herbal teas, yet the teas contain no warnings about their possible danger (Talalaj and Czechowicz: 1990b). However, the Government has promised reviews of labelling, advertising, and packaging requirements, for ‘health foods’ in the future (Wiesner:1984).

Many herbal teas are still available in Australia which contain potentially toxic substances (Talalaj and Czechowicz:1990b). Recent publications in the medical press have discussed the toxic and undesirable substances found in some herbal teas and the adverse reactions reported in adults (Lewis and Smith:1979, Penn:1988). Articles in the lay press have also expressed concern about the safety of herbal teas (ACA:1985, Johnson:1991).

Table 2.1 outlines the undesirable substances present in a selection of herbal teas and their reported adverse effects. As herbal teas become more popular, exposure to toxic herbs is likely to increase, since most consumers lack knowledge of herbal efficacy, dosing, and toxicity (Ridker:1989).
### TABLE 2.1: Undesirable substances present in selected herbal teas and potential adverse effects


<table>
<thead>
<tr>
<th>Adverse Effect</th>
<th>Tea Constituent</th>
<th>Suspected Toxin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HEMATOLOGIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coumarin-like action</td>
<td>Melilot, yarrow, woodruff, lovage</td>
<td>Coumarin</td>
</tr>
<tr>
<td><strong>HEPATIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatic veno-occlusive disease/ hepatic failure</td>
<td>Comfrey, gordolobo, mate, groundsel, tansy ragwort</td>
<td>Pyrrolizidine alkaloids</td>
</tr>
<tr>
<td>Hepatocarcinogen</td>
<td>Sassafras</td>
<td>Safrole</td>
</tr>
<tr>
<td><strong>GASTROINTESTINAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastroenteritis, diarrhoea, hematochezia</td>
<td>Buckthorn, senna, poke root</td>
<td>Anthraquinones Saponins</td>
</tr>
<tr>
<td><strong>CARDIAC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac glycoside effects (arrhythmias)</td>
<td>Foxglove</td>
<td>Digitalis</td>
</tr>
<tr>
<td>Hyperaldosteronism (hypernatremia, etc)</td>
<td>Liquorice</td>
<td>Saponins</td>
</tr>
<tr>
<td><strong>NEURAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticholinergic effects (dry mouth, delirium, blurred vision, etc)</td>
<td>Lobelia</td>
<td>Lobeline, atropine, scopolamine</td>
</tr>
<tr>
<td>CNS stimulation</td>
<td>Mate</td>
<td>Caffeine</td>
</tr>
<tr>
<td><strong>ANAPHYLAXIS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaphylactic shock</td>
<td>Chamomile</td>
<td>Compositae family antigens</td>
</tr>
</tbody>
</table>
2.2 Herbal Teas: Potential Risks to the Fetus

While it is recognised that herbal teas can be dangerous if drunk by lactating women (Roulet et al.:1988), there has been very little published on the safety of consuming herbal teas during pregnancy. Any available case studies are the result of observing women whose herbal tea consumption was judged to be related to some adverse effect of pregnancy. These observations are limited in number, making it difficult to draw firm conclusions about the effects of various herbal teas on a developing fetus.

Research regarding the potential toxicity of herbal teas used during pregnancy is also scarce (NFA:1992). Veale et al.(1992) find this both frightening and ironic, considering the extent to which the public and health professionals are educated and continuously reminded about the dangers of taking drugs in pregnancy.

Despite the lack of clinical research and case studies, it is felt the risks to the fetus during pregnancy require special consideration when looking at the toxicity of herbal teas (Moulds and McNeil:1988).

Since the toxic effects of some herbal teas appear to be cumulative, children exposed to these teas from an early age may be at a greater risk than adults (Allen et al.:1989). Roulet et al.(1988) report the case of a 38 day old child who died recently in Switzerland as a result of hepatic veno-occlusive disease. The child’s mother had consumed a herbal tea containing pyrrolizidine alkaloids daily throughout her entire pregnancy (Spang:1989). The absence of clinical hepatic damage in the mother suggests the fetal liver may be more sensitive to the toxic action of pyrrolizidine alkaloids (Talalaj and Czechowicz: 1990a).
Several herbs used in teas are potential abortifacients since they have a stimulant action on the uterus (Baldwin et al.: 1987). Pennyroyal is one such herb, used to induce menstrus when taken as herbal tea. However, it contains a volatile oil which may induce abortion (Gunby: 1979) as well as cause hepatic and renal damage in large doses (Gunn: 1921). Recent research suggests that raspberry leaves also contain a uterine stimulant. Although raspberry leaf tea has been used for many years in severe cases of dysmenorrhoea and to reduce the pain of labour (Whitehouse: 1941, Beckett et al.: 1954), it is best avoided during pregnancy, along with other potential abortifacients (Baldwin et al.: 1987).

Herbs such as melilot, lovage, and yarrow contain coumarins which can reduce the ability of the blood to clot if taken in large amounts (Baldwin et al.: 1987). Coumarins in a tea made from tonka beans, melilot, and sweet woodruff were the cause of a young woman's excessive menstrual bleeding and prolonged blood clotting time (Hogan: 1983). It is not clear what the effect of coumarins may be if consumed during pregnancy.

A number of herbs may also contain substances that are teratogenic in humans. Plants such as hemlock and white hellebore were found to cause deformities in the fetus during animal experiments (Keeler: 1984).

Although the amount of herbal tea required to produce many of these toxic effects would exceed normal consumption, it is suggested that professional advice be sought before any herb is consumed during pregnancy (Baldwin et al.: 1987).
2.3 Herbal Tea Consumption During Pregnancy

Although several studies have examined caffeine consumption by women, including intake during pregnancy (Guiry and Bisogni: 1986, Bergman et al.: 1992, Sheriff et al.: 1992), there is no data available on the types of herbal teas women in Western countries consume during pregnancy. This is despite the recognition that herbs are used by women throughout the world for birth control, and during pregnancy and labour (Anderson and Greener: 1991, Veale et al.: 1992, Bourdy and Walter: 1992).

Information regarding reasons for consuming herbal teas during pregnancy, and patterns of consumption, is also scarce, even though pregnancy is a time of spontaneous dietary change for many women (Anderson and Shephard: 1989).

Along with others in the community, it is likely that pregnant women are attracted to the idea that herbal teas are ‘natural’ and therefore entirely safe (Talalaj and Czechowicz: 1990a). A survey conducted in the United States found that ‘natural’ is the most convincing sales claim to place on a beverage. Almost a quarter of the consumers surveyed believed that natural products were healthier, safer, and had no adverse effects (Dubick: 1983).

Clinical studies which address the benefits of consuming herbal teas during pregnancy are scarce (Liu: 1990), yet herbal books and similar material often describe the apparent benefits in detail and are widely available. Unfortunately, the contained advice is rarely based on the results of scientific studies, and is often incorrect and outdated with no necessary warnings (Larkin: 1983).

Table 2.2 lists several herbal teas commonly consumed in pregnancy, and their various uses.
TABLE 2.2: Uses of various herbal teas by women during pregnancy  

<table>
<thead>
<tr>
<th>Herbal Tea</th>
<th>Use in Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackberry (leaves)</td>
<td>Iron deficiency anaemia</td>
</tr>
<tr>
<td>Chamomile (flowers)</td>
<td>Headaches, insomnia, digestive complaints eg: constipation, heartburn</td>
</tr>
<tr>
<td>Dandelion (flowers)</td>
<td>Iron and folic acid deficiency anaemia</td>
</tr>
<tr>
<td>Ginger (root)</td>
<td>Nausea, vomiting</td>
</tr>
<tr>
<td>Ginseng (root)</td>
<td>Improvement of stamina, concentration, healing, stress resistance; regulate blood pressure and blood glucose levels; irritability, mood swings</td>
</tr>
<tr>
<td>Horsetail (herb)</td>
<td>Urinary inflammations and infections, oedema (diuretic), insomnia</td>
</tr>
<tr>
<td>Lemon balm (leaves)</td>
<td>Reduce anxiety and tension and associated conditions eg: insomnia, headaches, stomach upsets</td>
</tr>
<tr>
<td>Nettle (leaves)</td>
<td>Iron deficiency, increase vitamin K storage</td>
</tr>
<tr>
<td>Peppermint (leaves)</td>
<td>Digestive upsets eg: indigestion, vomiting, dyspepsia</td>
</tr>
<tr>
<td>Raspberry (leaves)</td>
<td>Toning of uterus to ease and improve efficiency of labour; threatened miscarriage</td>
</tr>
<tr>
<td>Red clover (flowers)</td>
<td>Iron deficiency anaemia</td>
</tr>
<tr>
<td>Rose hip (hips)</td>
<td>Supplement vitamin C levels</td>
</tr>
<tr>
<td>Squaw vine (herb)</td>
<td>Facilitate labour and delivery (stimulate and strengthen uterine contractions), exhaustion, irritability</td>
</tr>
</tbody>
</table>
It has been suggested that pregnant women may consume herbal teas as an alternative to tea and coffee in an effort to reduce their intake of caffeine (Baldwin et al.:1987). Although the effect of caffeine on pregnancy outcome is controversial (N.I.N.:1987, Narod et al.:1991, Mills et al.:1993), the United States Food and Drug Administration (FDA) advised women to avoid unnecessary caffeine consumption during pregnancy (Goyan:1980, cited in Worthington-Roberts:1987). However, some herbal teas actually contain substantial amounts of caffeine (Baldwin et al.:1987), which pregnant women may not be aware of.

Taste is an important factor in food selection and consumption during the course of pregnancy (Bowen:1992). It is well known that alterations in taste and smell during pregnancy often result in aversion to caffeine containing beverages (Fairburn et al.:1992), with many pregnant women consequently reducing their intake of tea and coffee (Sheriff et al.:1992). Herbal teas may therefore be consumed by women during pregnancy as an alternative to tea and coffee, due to this aversion to caffeine.

2.4 Sources of Information During Pregnancy

Sound nutritional advice can greatly promote the positive health status of pregnant women (Cross and Walsh:1971). Studies have found that pregnant women are responsive to nutrition advice (Hunt et al.:1976) and possess a thirst for health information (Eiser and Eiser:1985).

Aaronson et al.(1988) found that pregnant women identified health care providers (physicians, nurses, and nurse-midwives) as their main source of information about what they should and should not do during their pregnancies. A greater reliance was placed on books as an information source by women who were more educated.
Dietitians also have an important role to play in providing nutrition information to pregnant women. Individual nutrition counselling has been found to significantly improve maternal and infant well-being, while remaining cost effective (Orstead et al.:1985). Those women who consider diet important during pregnancy are more likely to visit a dietitian and to make the suggested changes to their diet (Orr and Simmons;1979).

General practitioners and obstetricians are usually the main contact personnel for pregnant women (Chamberlain et al.:1991). As such, they can strongly influence the dietary practices of women during pregnancy through the provision of information (Cross and Walsh:1971).

For those women choosing a homebirth, a midwife is sometimes the sole health care provider during pregnancy and labour (Anderson and Greener: 1991, Bastian and Lancaster:1992). The majority of these women receive care from more than one type of practitioner, usually a general practitioner and a registered midwife (Bastian:1992). Visits to an obstetrician or antenatal clinic only are not usual among women who choose homebirth (Crotty et al.:1990) but childbirth education classes are often attended (Bastian:1992).

Many women also rely on books as a source of information during pregnancy (Aaronson et al.:1988), particularly those women who are planning to give birth at home (Bastian:1992).

2.5 Characteristics of Women Who Choose to Give Birth at Home

In Australia, there are considerable variations in the incidence of planned homebirths between States and Territories. As a percent of total births from 1988 to 1990, homebirths accounted for 0.2% in Victoria, 1.9% in the Australian Capital Territory, and 0.5% Nationally (Bastian and Lancaster: 1992). Since homebirths comprise such a small
percent of all Australian births, it is not surprising that there is very little information available on the characteristics of women who request homebirths (Crotty et al.:1990).

In spite of this, several studies have shown that women who choose to give birth at home are usually older, more educated, and tend to be of a higher socio-economic status than those women who plan a hospital birth (Crotty et al.:1990, Bastian and Lancaster:1992). They also appear to have a level of motivation that may not be characteristic of other populations (Tyson:1991) and which could be a contributing factor in the high rate of breastfeeding among women choosing homebirth (Anderson and Greener:1991).

Health professionals need to recognise that women who choose not to give birth in hospital may possess attitudes which differ from those of women who prefer a ‘conventional’ hospital birth. The concern these women have with the disease orientation of maternity care (Walderstrom and Nilsson:1993) is likely to influence their attempts at accessing, utilising, and retaining information provided during pregnancy. Walderstrom and Nilsson (1993) found that women who choose alternative maternity care appear more interested in being actively involved in their own care. This is possible with birth at home, since a team is formed between the parents and health care attendant(s) in which the parents are the key participants in decision-making (Soderstrom et al.:1990).

Women who choose alternative maternity care also possess a more critical and negative attitude towards conventional medicine and procedures (Waldenstrom and Nilsson:1993, Bastian:1992). This attitude has been recognised in several studies, with women preferring homebirth having a low rate of ultrasound examination, a low usage of analgesia in labour, and being less likely to have vitamin K administered to their babies (Crotty et al.:1990, Anderson and Greener:1991, Bastian and Lancaster:1992).
Although it has been found that the majority of women who choose to give birth at home possess positive attitudes towards alternative medicine (Bastian:1992), the use of 'unconventional' substances, such as herbal tea, by these women during pregnancy has not been studied. More research is needed in this area, particularly since it is thought that women with characteristics similar to those who choose alternative maternity care may be a growing proportion of the female population (Waldenstrom and Nilsson:1993).

This study will therefore examine the consumption of herbal teas during pregnancy by women who choose to give birth at home. As part of the sample selection of the study population, a retrospective period of up to two years for the last birth was selected for several reasons.

The accuracy of self-report data varies considerably depending on factors such as the substance used and time of the interview (Jacobson et al.:1991). de Jong et al.(1991) felt that a retrospective period of seven years was too long for women to accurately recall drug use during pregnancy. Jacobson et al.(1991) found that mothers reported higher levels of alcohol consumption 13 months retrospectively than when interviewed during pregnancy. The two year time period in this study was therefore chosen to maximise the number of participants while limiting any inaccuracies in recall of herbal tea consumption.

In Australia, the average interval between the first and second birth is two and a half years, and between the second and third child just over three years (Hugo and Wood:1983). The choice of the two year time period for this study was to ensure that some of the respondents were 'between' births as well as currently pregnant.
2.6 Use of Surveys For Data Collection

Surveys are used in health care research when information on specific variables within a population is required (Polgar and Thomas:1991). Although the consumption of herbal teas in a population has not been studied, surveys have been used successfully to collect data on caffeine intake. Guiry and Bisogni (1986) used a self administered questionnaire, a food frequency questionnaire, and a 24-hour recall form to collect information on caffeine knowledge, attitudes, and practices of young women. A similar study by Bergman et al.(1992) also used a food frequency questionnaire and self-administered questionnaire, as well as a three day food diary. Sheriff et al.(1992) successfully collected data on the caffeine intake and beliefs of a group of pregnant and lactating women with a questionnaire consisting of self-administered sections and an interview.

While questionnaires are often used to collect survey data, postal questionnaires are particularly useful if a large number of people need to be surveyed. However, their feasibility and usefulness is limited by the response rate. Achieving a high response rate to postal questionnaires is desirable in order to minimise bias due to non responses (Shiono and Klebanoff:1991).

A response rate of 78 percent was obtained from a postal questionnaire surveying women who had given birth 13 months to nine years previously and had received a dural puncture (Macarthur et al.:1993). A similar response rate (79 percent), from a postal survey collecting views on the maternity service from postnatal women, was considered good by the researchers (Melia et al.: 1991). Griffiths et al.(1993) felt the overall response rate of 50 percent to their survey of women who had gestational diabetes was reasonable.
Adams et al. (1991) found that the response rate to a postal questionnaire varied considerably according to the level of education and marital status of the mothers surveyed. Literacy of the study population and level of motivation will also influence the response rate (Griffiths et al.: 1993). The cost to the individual in returning the questionnaire is an additional but related factor. Stamped envelopes have an improved response rate compared with franked return envelopes (Shiono and Klebanoff: 1991), yet the cost of both these methods is often prohibitive for many researchers. It is believed the response rate to postal questionnaires can be further improved by ensuring the importance and relevance of the survey is stressed to the subjects, along with their importance as individuals (Shiono and Klebanoff: 1991).

Despite the limitations that response rate places on the feasibility and usefulness of a postal questionnaire for collecting survey data, Adams et al. (1991) concluded that mail surveillance of new mothers can yield adequate response rates in selected population groups.

2.7 Dietary Intake Methodology

Several methods are available for obtaining dietary intake information. These include direct observation, dietary history, twenty-four hour recalls, food diaries, and food frequency questionnaires (Barrett-Connor: 1991). Each of these dietary intake methods has advantages, disadvantages, and limitations, with the choice of a particular method depending on the aims of the study, the type of data and degree of accuracy required, and the characteristics and size of the study population.

A food frequency questionnaire (FFQ) is ideal for studying food habits (Truswell: 1988). It is considered to be more representative of usual intake than other dietary intake methods (Barrett-Connor: 1991), particularly in pregnancy when food consumption fluctuates during the 40-week gestation (Greeley et al.: 1992).
Although FFQs are considered to be less accurate than other methods for quantitatively estimating nutrients (Truswell:1988), they can be used to classify subjects into broad categories of intake, which is all that is required in this study.

The advantages of a FFQ include a high response rate, comparatively low burden to respondents, the ability to be self-administered, and the relative inexpense. These advantages mean a FFQ is highly suitable for fast administration to large numbers of people by mail (Horwath:1990).

The items listed on a FFQ need to be appropriate for the particular study population. A new questionnaire may need to be designed or an existing one adapted for a new study. The selection of items for inclusion in the FFQ is usually obtained from previous open-ended methods of dietary assessment, such as food diaries, which identify the foods and beverages contributing significantly to the diet of the study subjects (Horwath:1990).

A major limitation to the use of FFQs is that the listing of items, although arbitrary, may influence responses. Secondly, respondents require a certain level of literacy, and thirdly, even if space is provided on a FFQ for additional items not included on the list, it is not known how complete the responses are (Barrett-Connor:1991). FFQs are also dependent on subject recall, with controversy existing over whether they provide an under or over estimation of intake compared with other commonly used dietary recall instruments (Stuff et al.:1983).

Since this study required semi-qualitative data on the consumption of a single group of beverages, a FFQ was considered the most appropriate method for assessing this intake. The recording of beverage intake during pregnancy using a FFQ has been used successfully in studies conducted by Bergman et al.(1992) and Sheriff et al.(1992).
2.8 Rationale for the Study

While adverse reactions to herbal teas in adults have been reported for many years, recent publications in the medical press have identified some herbal teas which can adversely affect the health of pregnant women and the developing fetus (Baldwin et al.: 1987, Spang: 1989). An examination of the types of herbal teas consumed by women during pregnancy, and patterns of consumption, is therefore indicated.

Several reasons have been proposed to explain why women may choose to consume herbal teas during pregnancy. The apparent health benefits of herbal teas and the ‘natural’ aspect are likely to be appealing. Herbal teas may also be drunk as an alternative to tea and coffee in an effort to reduce caffeine intake (Baldwin et al.: 1987) and because of taste aversion to caffeine (Fairburn et al.: 1992).

Herbal teas may particularly appeal to women who choose to give birth at home, since these women often possess positive attitudes towards alternative medicine (Bastian: 1992). They are also more likely to be well educated, critical of conventional medicine and procedures, and very interested in their own care during pregnancy (Waldenstrom and Nilsson: 1993).

Considering these characteristics, the consumption of ‘unconventional’ substances such as herbal teas by women preferring homebirth is of considerable interest. The source of information used during pregnancy by this group of women, along with their herbal tea intake, has implications for health practitioners, particularly nutrition educators.
CHAPTER 3

MATERIALS AND METHOD

3.1 Ethics Approval

The study protocol was approved by the Human Experimentation Ethics Committee at the University of Wollongong (Appendix 1).

3.2 Study Population

The study population consisted of women involved with homebirth support groups in N.S.W. who were currently pregnant or had given birth within the last two years, and who drank herbal tea during their most recent pregnancy. The homebirth support groups contacted were in Wollongong, Sydney, Hunter Valley, Bega, Nimbin, and Bathurst.

Based on studies by Bergman et al.(1992) and Sheriff et al.(1992), which examined caffeine intake in women, at least 45 women were considered necessary for this study.

Collaboration between Homebirth Australia and the AIHW National Perinatal Statistics Unit has resulted in reports on homebirths in Australia for 1985 to 1990. In 1990, 408 planned homebirths occurred in N.S.W., comprising 0.4% of total births in N.S.W. (Bastian and Lancaster:1992). Although 37 women completed and returned questionnaires, the actual number of women who fulfilled the sample criteria and were therefore eligible to participate in this study was not known.
3.3 Sample Selection

The study population was selected according to the following criteria;

a) women who were involved with homebirth support groups in N.S.W.

b) women who were currently pregnant or had given birth within the last two years (from when they received the questionnaire)

c) women who drank herbal tea during their current pregnancy, or most recent pregnancy within the last two years

3.4 Data Collection

Information was collected from survey participants by means of an anonymous questionnaire. A list of homebirth support groups in N.S.W. was obtained from the Homebirth Access Sydney newsletter 'Birthings' and telephone contact was made with a person involved with each of the nine homebirth support groups listed. Only six of the groups were currently 'active' and therefore able to be used for the survey. Verbal permission was obtained to distribute questionnaires within each of these six groups, along with an estimation of the number of women involved with each of the homebirth support groups.

On the basis of this estimate, 560 questionnaires were prepared. The questionnaires were then sent to the contact person for each of the six homebirth support groups, where they were distributed through the local homebirth newsletter, by hand at homebirth meetings, or by some midwives to women in their care.
Those women who fitted the sample criteria, as explained on the questionnaire, were asked to complete the questionnaire and return it to the researcher by late September, 1993.

The questionnaire, taking about five minutes to complete, requested demographic information as well as information on patterns of herbal tea consumption and sources of information during pregnancy. Part of the questionnaire involved completion of a short FFQ. Participants were asked to indicate the frequency (cups per day, week, or month) with which they consumed various herbal teas during pregnancy. As well as listing a comprehensive variety of herbal teas, the FFQ also included spaces for the addition of any herbal teas not already included.

Different coloured questionnaires were sent to each of the homebirth support groups, enabling the location of women completing the questionnaires to be identified.

A copy of the questionnaire is provided in Appendix 2.

3.5 Data Analysis

Due to the small sample size of 37 descriptive statistics, as percentages of responses, were used for most results. The occupation of the mother was classified according to the Australian Standard Classification of Occupations used in the 1986 Census. The variety of herbal teas consumed and frequency of consumption were expressed as percentages after totalling the results obtained from the FFQ part of the questionnaire.
CHAPTER 4

RESULTS

4.1 Description of the Sample

A summary of the raw data collected in this study has been included in Appendix 3.

Five hundred and sixty questionnaires were distributed to homebirth support groups in N.S.W. Thirty seven women completed and returned a questionnaire, a response rate of seven percent. The majority of these women (78 percent) had given birth within the last two years while the remaining 22 percent (eight women) were pregnant.

The demographic characteristics of the study sample are presented in Table 4.1.

The majority of the women were married (59 percent) or living with their partner (32 percent). Just over three quarters were aged 28 years or older, with only six percent aged under 21.

The results indicate that 54 percent of the sample had completed tertiary level education, including 35 percent who had completed studies at University. The types of education categorised under ‘other’ included Teacher’s College (1 woman), Naturopathy Diploma (1 woman), and hospital based nurse/midwifery training (5 women).
<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Percent of Sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current age (years)</strong></td>
<td></td>
</tr>
<tr>
<td>≤ 20</td>
<td>6% (2)</td>
</tr>
<tr>
<td>21 - 27</td>
<td>16% (6)</td>
</tr>
<tr>
<td>28 - 33</td>
<td>35% (13)</td>
</tr>
<tr>
<td>≥ 34</td>
<td>43% (16)</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>6% (2)</td>
</tr>
<tr>
<td>Married</td>
<td>59% (22)</td>
</tr>
<tr>
<td>Divorced/ separated</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Widowed</td>
<td>(0)</td>
</tr>
<tr>
<td>Living with partner</td>
<td>32% (12)</td>
</tr>
<tr>
<td><strong>Level of education completed</strong></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>(0)</td>
</tr>
<tr>
<td>Secondary school</td>
<td>27% (10)</td>
</tr>
<tr>
<td>Technical college/ TAFE</td>
<td>19% (7)</td>
</tr>
<tr>
<td>University</td>
<td>35% (13)</td>
</tr>
<tr>
<td>Other</td>
<td>19% (7)</td>
</tr>
</tbody>
</table>

The responses provided by the study sample to the open ended question requesting occupation were categorised. The summarised results are presented in Table 4.2.
TABLE 4.2: Percent of study sample in each occupational category

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Percent of Sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager/administrator</td>
<td>8% (3)</td>
</tr>
<tr>
<td>Professional</td>
<td>24% (9)</td>
</tr>
<tr>
<td>Para-professional</td>
<td>24% (9)</td>
</tr>
<tr>
<td>Tradesperson</td>
<td>8% (3)</td>
</tr>
<tr>
<td>Clerk</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Salesperson/Personal Service Worker</td>
<td>(0)</td>
</tr>
<tr>
<td>Plant Machine Operator, and Driver</td>
<td>(0)</td>
</tr>
<tr>
<td>Labourer and Related Worker</td>
<td>(0)</td>
</tr>
<tr>
<td>Other: Self employed</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Mother/home maker</td>
<td>14% (5)</td>
</tr>
<tr>
<td>Student</td>
<td>11% (4)</td>
</tr>
<tr>
<td>Not stated</td>
<td>5% (2)</td>
</tr>
</tbody>
</table>

Fifty six percent of the sample belonged to the top three occupational categories (management, professional, para-professional). None of those surveyed were employed in the lowest three occupational areas. One third of the sample did not fit into the A.B.S. Classification of Occupation categories, including 14 percent who indicated their usual occupation was that of mother/home maker and 11 percent who were students.

Almost one quarter (24 percent) of the respondents were health practitioners. Of these nine women, three were trained nurses (one was also a student midwife), five were midwives and one was a naturopath.
4.2 Pattern of Herbal Tea Consumption During Pregnancy

Eighty seven percent of the sample claimed to have changed their herbal tea intake during pregnancy. Of those, 79 percent increased and eight percent decreased their intake. Sixty two percent of those surveyed stated they drank herbal tea as well as tea/ coffee during their pregnancy, while the remaining 38 percent drank herbal tea as an alternative to tea/ coffee. The pattern of herbal tea consumption during pregnancy is presented in Table 4.3.

### TABLE 4.3: Herbal tea consumption of study sample during pregnancy

<table>
<thead>
<tr>
<th>Herbal Tea Consumption</th>
<th>Increased % of Sample (n)</th>
<th>Unchanged % of Sample (n)</th>
<th>Decreased % of Sample (n)</th>
<th>TOTAL % of Sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>As well as tea/ coffee</td>
<td>49% (18)</td>
<td>8% (3)</td>
<td>5% (2)</td>
<td>62% (23)</td>
</tr>
<tr>
<td>Alternative to tea/ coffee</td>
<td>30% (11)</td>
<td>5% (2)</td>
<td>3% (1)</td>
<td>38% (14)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>79% (29)</td>
<td>13% (5)</td>
<td>8% (3)</td>
<td>100% (37)</td>
</tr>
</tbody>
</table>

An open ended question requested reasons why women drank herbal tea as an alternative to tea/ coffee during pregnancy. The responses of the 14 women for whom this question was applicable are detailed in Table 4.4. Just over half the reasons given (52 percent) indicate that herbal teas were drunk as an alternative to tea/ coffee during pregnancy because of their proposed health benefits. The adverse effects of tea/ coffee and taste aversions were additional categories into which the remaining reasons were placed (24 percent of reasons in each category).
TABLE 4.4: Reasons provided by women for consuming herbal teas as an alternative to tea/ coffee during pregnancy

<table>
<thead>
<tr>
<th>Response Category</th>
<th>% of Responses (n)*</th>
<th>Reasons Provided By Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taste aversion</td>
<td>24% (6)</td>
<td>Dislike taste of tea/ coffee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Go off tea/ coffee when pregnant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don't like caffeine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taste buds seem to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enjoy herbal teas</td>
</tr>
<tr>
<td>Adverse effects of tea/ coffee</td>
<td>24% (6)</td>
<td>I become nervous on caffeine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Too much tea/ coffee: can't sleep</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Herbal teas are caffeine free so pose less risk to unborn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allergy to coffee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To avoid/ limit caffeine/ tannin intake</td>
</tr>
<tr>
<td>Benefits of herbal teas</td>
<td>52% (13)</td>
<td>Health benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Healing purposes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nutritive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To reduce morning sickness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To add more iron/ for anaemia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boost vitamin C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To strengthen my uterus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>As a preparation for birth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To help during labour</td>
</tr>
</tbody>
</table>

* Several women provided more than one reason
4.3 Variety of Herbal Teas Consumed During Pregnancy and Frequency of Consumption

The percent of women who consumed each herbal tea at least once during their pregnancy was calculated. Figure 4.1 illustrates the most popular herbal teas, based on these calculations.

![FIGURE 4.1: Herbal teas most frequently consumed by study sample at least once during pregnancy](chart)

Chamomile tea was the most popular herbal tea, with 78 percent of the subjects consuming it at least once during their pregnancy. Other popular herbal teas included raspberry, consumed by 68 percent of the women at least once during their pregnancy, peppermint (57 percent), and lemongrass (16 percent). Rosehip, ginger, and liquorice teas were each consumed by eight percent of the women at least once during pregnancy. The remaining 13 herbal teas were consumed infrequently, by a small number of women. Forty three percent of the women drank one or more of these teas at least once during their pregnancy.
The FFQs provided information on the frequency with which each herbal tea was consumed by the study sample during pregnancy. Table 4.5 lists the percent of women who consumed various herbal teas at least once a day throughout their pregnancy.

**TABLE 4.5: Percent of study sample who consumed herbal teas daily throughout their pregnancy**

<table>
<thead>
<tr>
<th>Herbal Tea</th>
<th>Percent of Sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raspberry</td>
<td>41% (15)</td>
</tr>
<tr>
<td>Chamomile</td>
<td>27% (10)</td>
</tr>
<tr>
<td>Peppermint</td>
<td>11% (4)</td>
</tr>
<tr>
<td>Ginger</td>
<td>8% (3)</td>
</tr>
<tr>
<td>Horsetail</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Lemon</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Lemongrass</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Nettle</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Orange</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Red Clover</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Rosehip</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Other (not stated)</td>
<td>8% (3)</td>
</tr>
</tbody>
</table>

Forty one percent of the sample (15 women) stated they consumed raspberry tea between one and three times a day throughout their pregnancy. Chamomile was also a popular tea, with 28 percent of women consuming it daily. Many herbal teas were only consumed by one woman, with intake varying from one to three cups a day.
Additional women indicated they consumed various herbal teas daily, but not continually, during their pregnancies. Three consumed raspberry leaf tea, one terminating consumption at 29 weeks gestation and the other two women commencing consumption in the last four and eight weeks of their pregnancies. One women drank a mixture of squaw vine and raspberry leaf tea daily during the last trimester of her pregnancy while ginseng tea was drunk daily by another women for a week prior to labour. For the first 12 weeks of pregnancy, one woman consumed chamomile tea daily and another drank peppermint tea daily.

Tables 4.6 and 4.7 present the percent of women who consumed various herbal teas on a weekly and monthly basis throughout their pregnancy.

**TABLE 4.6: Percent of study sample who consumed herbal teas weekly throughout their pregnancy**

<table>
<thead>
<tr>
<th>Herbal Tea</th>
<th>Percent of Sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peppermint</td>
<td>35% (13)</td>
</tr>
<tr>
<td>Chamomile</td>
<td>24% (9)</td>
</tr>
<tr>
<td>Raspberry</td>
<td>11% (4)</td>
</tr>
<tr>
<td>Lemongrass</td>
<td>11% (4)</td>
</tr>
<tr>
<td>Rosehip</td>
<td>5% (2)</td>
</tr>
<tr>
<td>Rosehip/ hibiscus</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Ginseng</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Fennel</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Mate</td>
<td>3% (1)</td>
</tr>
</tbody>
</table>
TABLE 4.7: Percent of study sample who consumed herbal teas monthly throughout their pregnancy

<table>
<thead>
<tr>
<th>Herbal Tea</th>
<th>Percent of Sample (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamomile</td>
<td>27% (10)</td>
</tr>
<tr>
<td>Raspberry</td>
<td>16% (6)</td>
</tr>
<tr>
<td>Peppermint</td>
<td>11% (4)</td>
</tr>
<tr>
<td>Liquorice</td>
<td>8% (3)</td>
</tr>
<tr>
<td>Blackberry</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Fennel</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Lemongrass</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Red clover</td>
<td>3% (1)</td>
</tr>
<tr>
<td>Senna</td>
<td>3% (1)</td>
</tr>
</tbody>
</table>

Chamomile tea was consumed by approximately one quarter of the women both on a weekly and monthly basis (24 and 27 percent respectively). Peppermint tea was drunk by just over a third of the sample (35 percent) on a weekly basis throughout pregnancy.

Several herbal teas were only consumed by individual women, with intakes varying from one to five times a week, to one to three times a month.
4.4 Sources of Information

The respondents were asked to indicate where they would most likely seek information if they had a question regarding the safety of consuming a herbal tea during pregnancy. The results are illustrated in Figure 4.2.

Most of the women (76 percent) indicated they would seek information from a midwife if questioning the safety of consuming a herbal tea during pregnancy. Forty three percent would ask a naturopath/herbalist but no-one would go to a dietitian. Although two women stated they would approach their doctor for the information, the doctors were trained in naturopathy and homeopathy. Nineteen percent of the women would seek the information from a source not listed. Of these seven women, five would use a book, one would question the childbirth educator, and one would visit a health food store.
5.1 Response Rate

The low response rate of seven percent (37 out of 560 questionnaires returned) was disappointing but not unexpected, due to lack of motivation on behalf of the women surveyed, the large number of questionnaires distributed, and the criteria for sample selection.

The retrospective time period of up to two years for this study was necessary to maximise the number of both pregnant and non-pregnant subjects while minimising inaccurate recall of herbal tea consumption. Although the chosen time period affected the response rate, as women who gave birth over two years ago were ineligible to participate, no changes are recommended to the period of study.

The remaining criteria for sample selection would have further reduced the number of potential subjects, particularly since the study focussed only on those women who had actually consumed herbal tea during pregnancy.

It is also likely that a number of eligible subjects declined to participate in the study, although Tyson (1991) feels that women planning homebirths have a level of motivation that may not be characteristic of other populations. Adams et al. (1991) and Griffiths et al. (1993) obtained response rates of between 30 and 89 percent, and 50 percent respectively, for their postal questionnaires.

The response rate may, however, be an accurate reflection of the number of women in this particular study sample who actually consume herbal tea during pregnancy.
Sheriff et al. (1992) successfully used a questionnaire to collect data on beverage intake during pregnancy. Their high response rate was due, in part, to the presence of the data collectors at all times to assist in completion of the questionnaire, plus part of the data collection involved an interview. The use of an interview and/or the presence of data collectors to collect information on herbal tea consumption during pregnancy was not necessary in this study, since it was thought that the women would have no difficulty completing the questionnaire due to their generally high level of education. Furthermore, this method of data collection was not considered feasible for this study, partly due to the large geographic area surveyed. Also, many of the homebirth support groups do not meet regularly, if at all, and those that do have fluctuating group numbers.

An additional factor which contributed significantly to the low response rate in this study was the number of questionnaires distributed. Although there were 408 planned homebirths in N.S.W. during 1990 (Bastian and Lancaster: 1992), the number of women fitting all of the sample selection criteria was not known. Hence, the number of questionnaires sent to each homebirth support group was only a rough estimate of the total number of women involved with each group. Many questionnaires were also distributed through group newsletters, an unknown number of which went to independent midwives and organisations such as Family Planning.

5.2 Characteristics of Study Sample

The majority of women in this study (78 percent) were aged 28 years or older, with only six percent aged under 21. These results are consistent with other Australian studies which indicate that women planning homebirths are more likely to be older than the National average, with a very low proportion of teenagers (Crotty et al.: 1990, Bastian and Lancaster: 1992).
Several overseas studies have found that women choosing alternative birth places are more likely to be married than the general child-bearing population (Soderstrom et al.:1990, Anderson et al.:1991). In Australia, women giving birth at home are much less likely to be married than Australian mothers generally: 31.1 percent of babies born at home are ‘ex-nuptial’, compared to 16.8 percent Nationally (Bastian:1992). This finding was replicated in the results of this study, where 32 percent of the women were living with their partner. Only fifty nine percent were married.

This study supported other findings that women who choose to give birth at home have a higher level of education than Australian women in general. Over 50 percent of the women in this study had completed tertiary education, including 35 percent who had studied at University. Bastian (1992) surveyed 552 women who planned to give birth at home, and found that close to 70 percent of these women had completed tertiary level education.

Fifty six percent of the women participating in this study belonged to the top three occupational categories (management, professional, para-professional). Crotty et al.(1990) also found this to be the case with 47.6 percent of the women in their study who planned homebirths. Tyson (1991) identified 46 percent of a homebirth population as full-time homemakers, compared to 14 percent in this study who indicated they were mothers/homemakers. Although this difference may partly be due to the smaller sample size of this study (37 compared to 1001), Tyson (1991) appears to have sought information on current occupation, as opposed to usual occupation which was requested in this study.
There appears to be an over representation in the study sample of women working in a health field. This is consistent with the results of Bastian (1992) and Waldenstrom and Nilsson (1993), who suggest the finding may be a result of health care providers having a greater ease of access to information about new alternatives. Considering five of the women in this study were midwives and three were trained nurses (one a student midwife) it may be more likely that their inside knowledge of the conventional birth process has produced this interest in homebirth.

5.3 Pattern of Herbal Tea Consumption During Pregnancy

Since it is recognised that many women throughout the world use herbs during pregnancy (Bourdy and Walter: 1993), it was not unexpected to find that the majority of women in this study (79 percent) increased their intake of herbal tea during pregnancy. Only eight percent decreased their intake, with the remaining 13 percent of women not altering their herbal tea consumption while pregnant.

Thirty eight percent of respondents indicated they consumed herbal tea as an alternative to tea/ coffee during pregnancy. These 14 women were asked to provide reasons for doing so. Fifty two percent of responses referred to the health benefits of herbal tea. These ranged from general statements concerning the nutritive and healing benefits of herbal tea to more specific reasons including "to reduce morning sickness" and "to strengthen my uterus".

Considering the lack of clinical studies which address the benefits of herbal teas, it is interesting to note the detail provided in the health reasons for consuming herbal tea as an alternative to tea/ coffee during pregnancy. However, information on the benefits of herbal tea is widely available in herbal books (Back: 1987, Mills: 1989), and homebirth books (Hills: 1985), which this group of women would have ready access to.
Almost one quarter of the reasons provided by the women mentioned adverse effects of tea, coffee, or caffeine, mainly on the mother. These effects included insomnia, nervousness, and allergy. Although the effect of caffeine on pregnancy outcome is controversial (Narod et al.:1991, Mills et al.:1993), one respondent stated "herbal teas are caffeine free therefore pose less risk to unborn". Another reason provided for consuming herbal tea as an alternative to tea/coffee during pregnancy was because of nervousness produced by caffeine, yet this respondent was consuming mate tea, which is high in caffeine (Baldwin et al.:1987).

The remaining 24 percent of responses involved taste issues. This result was not unexpected, since it is well known that alterations in taste and smell during pregnancy often result in aversion to caffeine containing beverages (Fairburn et al.:1992). Responses provided by two women in this study serve to illustrate this. One woman "goes off tea or coffee when pregnant" and another woman's "taste buds seem to change...body telling me to drop the caffeine I suspect". Several of the women may also continue to avoid tea/coffee when not pregnant since they simply do not like the taste.

Considering the reasons provided by many of these women for avoiding tea/coffee during pregnancy, it is surprising to find that 62 percent of the respondents in this study continued to consume tea/coffee, along with herbal tea, during pregnancy.

5.4 Herbal Tea Intake

The results of this study found that 19 varieties of herbal teas were consumed by the respondents during pregnancy, along with several others not specified.

Chamomile was the most popular herbal tea, with 78 percent of the sample consuming it at least once during pregnancy. Approximately a quarter of the sample consumed this tea on a daily, weekly or monthly basis throughout pregnancy.
The popularity of chamomile tea is understandable, since herbal books claim it can be used to alleviate headaches and insomnia as well as improve digestive complaints such as heartburn and constipation (Mills:1989). These benefits, combined with the fact that the only adverse effects reported have been anaphylactic reactions in two susceptible adults (Benner et al.:1973, Casterline:1980), would make chamomile tea appealing to pregnant women.

The finding that raspberry tea was consumed by 68 percent of the sample at least once during pregnancy, including forty one percent who consumed it daily, was not unexpected. Raspberry tea is considered by many people to be the most popular herbal tea for pregnancy, as it tones the uterus and increases its efficiency during labour (Hills:1985). This belief is reflected in the reasons provided by several women in this study for why they consume herbal tea as an alternative to tea/coffee during pregnancy. They include "to strengthen my uterus", "to help during labour", and "as a preparation for birth'.

Raspberry tea was originally thought to contain a substance that relaxed the uterus, and was even used in hospitals to 'make things easier' during labour (Whitehouse: 1941). However, recent research suggests raspberry tea contains a uterine stimulant so, as a potential abortifacient, should be avoided during pregnancy (Baldwin et al.:1987). Others believe it will prevent miscarriage. These contradictions are reflected in the results of this study. Of the four women who consumed raspberry tea daily, but not continually, during pregnancy, three commenced consumption in the last twelve, eight, and four weeks of their pregnancies. This may have been to avoid possible miscarriage earlier on, yet another women consumed raspberry tea daily until 29 weeks gestation, possibly for the same reason.
Peppermint tea was consumed most frequently on a weekly basis, with 57 percent of the sample consuming it at least once during their pregnancy. Peppermint tea is often used for digestive complaints (Back: 1987). It has a high tannin content (Baldwin et al.: 1987), which many people may not be aware of, but no adverse effects are expressed in the literature.

The remaining herbal teas were consumed by only a small number of women and included more usual teas such as orange, lemongrass, and rosehip. These are often considered to be healthy and delicious alternatives to tea and coffee (Larkin: 1983, Ridker: 1989).

Several women also consumed herbal teas that have produced adverse effects in some people, as reported in the medical literature. These teas include senna, mate, and liquorice. Table 2.1 presents the undesirable substances present in these teas and the possible adverse effects, yet their effect during pregnancy is not known. No herbs were consumed that are listed as prohibited botanicals in proposal P54 from the NFA.

5.5 Sources of Information During Pregnancy

Most of the women in this study (76 percent) indicated they would seek information from a midwife if they had a question regarding the safety of consuming a herbal tea during pregnancy. Since a midwife is usually the main health care provider during pregnancy for women planning a homebirth (Anderson and Greener: 1991), this result is not surprising. Aaronson et al. (1988) found that the health care provider category, which included physician, nurse, and nurse-midwife, was the most frequently cited source of information for pregnant women.
Only two women in this study would approach their doctor for information on herbal teas. This is in marked contrast to the findings of Eiser and Eiser (1985) where the general practitioner was perceived as a vital source of information during pregnancy, yet the midwife was not. Although physicians do not usually possess in-depth knowledge of herbal remedies (Ridker:1987), the two doctors mentioned had training in naturopathy. The difference between these studies is likely due to the type of information sought, as well as the interest of this study sample in homebirth and consequently their choice of health care provider.

It is recognised that some non orthodox practitioners possess in-depth knowledge of herbal efficacy, dosing, and toxicity (Ridker:1987), as well as clinical experience in the use of herbs (Wiesner:1984). Forty three percent of the women in this study stated they would ask a naturopath or herbalist for information on the safety of consuming a herbal tea during pregnancy. These herbal practitioners are obviously recognised as being expert sources of information on herbal teas.

None of the women in this study would go to a dietitian for information on the safety of consuming a herbal tea during pregnancy, although dietitians play an important role in providing nutrition information to pregnant women (Orstead et al.:1985). Since the majority of dietitians are located in hospitals, the women in this study may have felt dietitians are more preoccupied with 'diet' and conventional disease conditions, rather than health. As such, they may not be viewed as experts on either pregnancy or herbal teas.

Books are a major information source for many pregnant women (Eiser and Eiser;1985), yet only five women in this study would utilise them for information on herbal teas. This number is low, considering that 54 percent have completed tertiary level education and would therefore be familiar with accessing books for information.
Four women from the sample would ask family/friends for information on the safety of consuming a herbal tea during pregnancy. Aaronson et al. (1988) found books to be more commonly used by those pregnant women who were better educated, while less educated women were more likely to make use of a more personal source of information such as family and friends. These differences may be due to the small sample size of this study. It is also possible that the women in this study preferred the more traditional wisdom, handed down verbally through family and friends over generations. This is certainly the case in cultures where many herbal remedies are used (Veale et al.:1992, Bourdy et al.:1992).

The use of multiple sources of information by women, if questioning the safety of consuming a herbal tea during pregnancy, is illustrated by this study. Many women indicated they would use more than one source of information, which suggests possible dissatisfaction with the information provided. On the other hand, they may wish to clarify issues, yet different information sources could provide conflicting information (Aaronson et al.:1988). Since very little research or clinical studies are available on the safety of consuming herbal teas during pregnancy, the accuracy of any information that may be provided is questionable.

5.6 Implications for Nutrition Education

The results of this study suggest there is no need for a major education campaign aimed at modifying herbal tea intake during pregnancy, in women who prefer homebirth. It is not clear what constitutes an acceptable intake for individual herbal teas, or even which herbal teas may be detrimental to the health of the woman or fetus if consumed during pregnancy. More research is therefore required into the effects of consuming herbal teas during pregnancy, particularly since it appears that women with characteristics similar to those who choose alternative maternity care may be a growing proportion of the female population (Waldenstrom and Nilsson:1993).
Despite this lack of research, health practitioners need to be aware of possible adverse effects of herbal teas if consumed during pregnancy, since they have a responsibility to provide pregnant women with accurate information based on current knowledge. Dietitians in particular need to promote themselves as experts in all aspects of nutrition, including ‘unconventional’ issues such as herbal teas.

Health professionals should consider the characteristics and attitudes of their target population if planning education sessions. Women preferring homebirth are usually well educated, very interested in their own health, and often critical of conventional procedures. These characteristics and attitudes can greatly influence the methods used by these women to access, utilise, and retain information during pregnancy.
CHAPTER 6

CONCLUSIONS

From the investigations carried out in this study, the following can be concluded:

The low response rate may reflect the number of women who actually consumed herbal tea during pregnancy. Lack of motivation and the strict sample criteria would have also been contributing factors to this poor response.

Herbal teas are drunk by some women involved with homebirth support groups, during pregnancy. Most of these women (87 percent) claimed to have changed their herbal tea intake during pregnancy. Of these, 79 percent increased their consumption of herbal tea. Sixty two percent of the women drank herbal tea as well as tea/ coffee during pregnancy, while the remaining 38 percent drank herbal tea as an alternative to tea/ coffee.

Just over half the reasons provided by the women, for why they consumed herbal tea as an alternative to tea/ coffee during pregnancy, referred to the health benefits of herbal teas. The remaining reasons were categorised equally into adverse effects of tea/ coffee (24 percent) and taste aversions to tea/ coffee/ caffeine (24 percent).

Nineteen herbal teas were identified by the women as being consumed during pregnancy. Chamomile was the most popular herbal tea, consumed by 78 percent of the women at least once during their pregnancy. Raspberry tea was the second most popular, and also the most likely to be consumed daily during pregnancy. Peppermint tea was the third most popular herbal tea, consumed by 57 percent of the women at least once during pregnancy.
The remaining herbal teas were consumed infrequently, by a small number of women. Several of these teas were consumed by women daily, but not continuously, during pregnancy. No herbal teas consumed were made from prohibited herbs.

The majority of women (76 percent) would seek information from a midwife if questioning the safety of consuming a herbal tea during pregnancy, which reflects their choice of primary health care provider. Forty three percent would approach a naturopath or herbalist, while two would ask their doctors (both trained in naturopathy). None of the women would ask a dietitian for the information, possibly as dietitians may not be seen as 'experts' on either herbal teas or pregnancy.

Due to the homogenous nature of the study group, the results cannot be seen as being representative of all pregnant women. However, the study did provide insight into patterns of herbal tea consumption during pregnancy for women preferring homebirth. While a major education campaign aimed at modifying the herbal tea intake of pregnant women is not necessary, health professionals should provide pregnant women with accurate information on possible adverse effects of herbal teas if consumed during pregnancy.
CHAPTER 7

LIMITATIONS OF THE STUDY

7.1 Response Rate

The low response rate of seven percent will have limited the extent to which the results represent the pattern of herbal tea consumption of all women involved with homebirth support groups in N.S.W.

The response rate was influenced by the large number of questionnaires sent out (560) and the fact they had to be returned to the researcher by mail, which required motivation. Eligibility criteria for participation would have further reduced the number of participants.

The retrospective time period of up to two years for this study was necessary in order to maximise the number of both pregnant and non-pregnant subjects while minimising inaccurate recall of herbal tea consumption. Although increasing the time period may increase the response rate, since more women would be eligible to participate, this may compromise the accuracy of information recalled. Changes are therefore not recommended to the period defined for the study.
7.2 Dietary Intake Methodology

Each dietary intake method has limitations which need to be considered when studying food or beverage intake. Since the FFQ used only requested information on herbal tea consumption, these limitations are minimised. Although the listing of herbal teas was arbitrary, this may have influenced responses. It is also possible that the addition of herbal teas by the respondent, if not already listed, may not be complete (Barrett-Connor:1991). The study design attempted to overcome any inaccuracies due to subject recall, and literacy level was not a problem with the particular population studied.

7.3 Questionnaire

Of the questions listed on the questionnaire, question 10 could have been worded more appropriately. This question sought to identify the sources of information each woman would use if questioning the safety of consuming a herbal tea during pregnancy. However, the wording of the question was not clear, so the women did not know if they could indicate more than one source of information. A more appropriate design of the question would have been to include the statement “Check one or more” after the question. A pilot study would have identified this problem.
CHAPTER 8

AREAS FOR FURTHER INVESTIGATION

8.1 Research

This study has highlighted the need for more information on the hazardous effects of herbal teas, particularly if consumed during pregnancy. These effects, as well as any benefits, should be scientifically researched.

8.2 Herbal Tea Consumption During Pregnancy

This study has provided baseline data on patterns of herbal tea consumption in women who prefer homebirth. An interesting area for further investigation would be to collect data on the herbal tea consumption of women during pregnancy, and compare the results between those women who prefer homebirth, hospital birth, and birth centres.

8.3 Sources of Information

This study identified midwives as an important source of information for women if questioning the safety of herbal teas in pregnancy, since they are the primary health care provider. An investigation into the main sources used by women for general information during pregnancy would be valuable. A comparison could then be made between the women, after grouping them according to their choice of birth place.
REFERENCES


Larkin, T. (1983), Herbs are often more toxic than magical. FDA Consumer October, 5-10.


23 June 1993

Mrs M Wilson
16 Edward Street
NORTH WOLLONGONG NSW 2500

Dear Mrs Wilson

Thank you for your response to the Committee's requirements for your Human Experimentation Ethics application HE93/171.

Your response meets with the requirements of the Committee and your application is now formally approved.

L. Roser
Chairperson
Human Experimentation Ethics Committee

cc. Head, Department of Public Health & Nutrition
DO YOU DRINK HERBAL TEA?

My name is Margaret Wilson and I am undertaking a study looking at herbal tea intake during pregnancy. This study is part of a Master of Science degree in Nutrition and Dietetics at the University of Wollongong. As I am planning a homebirth myself later this year, I am particularly interested in the herbal tea intake of others who are also appreciative of homebirth.

If you are pregnant, or have given birth in the last two (2) years, I would appreciate if you would answer the following questions and return the completed questionnaire, by late September, to:

Margaret Wilson  
5 Wiseman Avenue  
Wollongong NSW 2500

SECTION A: BACKGROUND INFORMATION

Please tick ( ) which best describes your answer.

1. What is your present martial status?
   [ ] Single  [ ] Married  [ ] Divorced/Separated  [ ] Widowed  [ ] Living with Partner

2. What is the highest level of education you have completed?
   [ ] Primary School  [ ] Secondary School  [ ] Technical College/TAFE  [ ] University  
   [ ] Other (Please Specify) ______________________

3. What is your usual occupation? _______________

4. Are you pregnant?
   [ ] No  [ ] Yes ( How many weeks? _____________ ) Go to Q7.

5. Have you given birth in the last two (2) years?
   [ ] No  [ ] Yes ( How long ago was the most recent birth? ___________ )

6. What is your age? ___________

SECTION B: HERBAL TEA CONSUMPTION

THE FOLLOWING QUESTIONS REFER TO YOUR CURRENT PREGNANCY OR YOUR MOST RECENT PREGNANCY IN TWO (2) YEARS.

7. During pregnancy, I drink herbal tea:  
   [ ] as well as tea or coffee  
   [ ] as an alternative to tea or coffee  
   Why? __________________________

8. During pregnancy, my herbal tea intake:  
   [ ] Increased  
   [ ] Decreased  
   [ ] Remained the same
9. Please indicate how many times a DAY, WEEK, or MONTH any herbal tea would be consumed.

For example:

<table>
<thead>
<tr>
<th>TEA</th>
<th>HERBAL TEA CONSUMPTION (In Cups)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DAY or WEEK or MONTH</td>
</tr>
<tr>
<td>Peppermint</td>
<td></td>
</tr>
<tr>
<td>Raspberry</td>
<td></td>
</tr>
</tbody>
</table>

This example means that the respondent drinks 1 cup of peppermint tea a day and 3 cups of raspberry tea a month.

<table>
<thead>
<tr>
<th>TEA</th>
<th>Aloe</th>
<th>Blackberry</th>
<th>Camomile</th>
<th>Comfrey</th>
<th>Eucalyptus</th>
<th>Feverfew</th>
<th>Ginseng</th>
<th>Hawthorn</th>
<th>Horsetail</th>
<th>Juniper</th>
<th>Liquorice</th>
<th>Mate</th>
<th>Pennyroyal</th>
<th>Peppermint</th>
<th>Pokeroot</th>
<th>Raspberry</th>
<th>Sassafras</th>
<th>Senna</th>
<th>Tansy</th>
<th>Uva-ursi</th>
<th>Wormwood</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>HERBAL TEA CONSUMPTION (In Cups) DAY or WEEK or MONTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. If you had a question regarding the safety of consuming a herbal tea during pregnancy, where would you seek information?

[ ] Doctor  [ ] Family or Friend  
[ ] Naturopath  [ ] Midwife  
[ ] Dietitian  [ ] Other (Please specify)

Any enquiries regarding the conduct of this Study should be directed to the Secretary of the Wollongong Human Experimentation Ethics Committee on (042) 21 3079.

Thank you for your time. Happy homebirthing.
## APPENDIX 3

### Response Rate to Questionnaire

<table>
<thead>
<tr>
<th>Name and Location of Homebirth Support Group in N.S.W.</th>
<th>Number of Questionnaires Sent</th>
<th>Number of Questionnaires Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homebirth Access Sydney</td>
<td>400</td>
<td>25</td>
</tr>
<tr>
<td>Hunter Valley Homebirth</td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td>Wollongong Homebirth</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Support Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bega Homebirth Support Group</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>Birth and Beyond (Nimbin)</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>Bathurst Homebirth Group</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>560</strong></td>
<td><strong>37</strong></td>
</tr>
<tr>
<td>Herbal Tea</td>
<td>Daily</td>
<td>Weekly</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Blackberry</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chamomile</td>
<td>7</td>
<td>2*</td>
</tr>
<tr>
<td>Fennel</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ginger</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ginseng</td>
<td>@</td>
<td>0</td>
</tr>
<tr>
<td>Hibiscus/Rosehip</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Horsetail</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lemon</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lemongrass</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Liquorice</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Mate</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Nettle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Peppermint</td>
<td>2*</td>
<td>1</td>
</tr>
<tr>
<td>Raspberry</td>
<td>6^</td>
<td>6</td>
</tr>
<tr>
<td>Red Clover</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Rosehip</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Senna</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Squaw Vine</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Other (not stated)</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
**LEGEND**

* Consumed daily during last three months of pregnancy

@ Consumed daily for one week prior to labour

^ Consumed daily during the last four weeks of pregnancy

= Consumed daily during the last eight weeks of pregnancy

~ Consumed daily during the first 29 weeks of pregnancy

+ Consumed daily during the last trimester of pregnancy